Remarks/Arguments

Claims 1-20 are pending in the present application. Claims 1-19 stand rejected. In the present Amendment, claims 1, 3 and 6-17 have been amended. It is respectfully submitted that no new matter has been introduced into the present application by any of the amendments to the claims. Reconsideration of the present application is respectfully requested in view of the following remarks.

The Office Action specifies that claims 1-19 are pending in the present application. This is incorrect. Claims 3-20 were added in the last Amendment. There are no rejections concerning claim 20 in the outstanding Office Action. However, the Office Action does not indicate that claim 20 is allowable. It is respectfully requested that the Examiner expressly consider claim 20 and either provide applicant with a Notice of Allowability with respect to that claim or identify any rejections that apply to that claim.

Statement of Substance of Interview Pursuant to 37 C.F.R. 1.133

Applicant's undersigned representative held a telephonic interview with Examiner Khare on April 10, 2007. During the interview, the Examiner's attention was directed to the lack of disclosure in the Lynch patent relating to maltitol solutions having maltitol contents above 94%, the errors in the Lynch reference relating to the determination of maltitol content, the lack of disclosure in the Darsow reference concerning the use of magnesium promoters and the teachings in the Darsow reference that teach away from using the hydrogenation temperatures that are used in the Lynch reference and recited in the present method claims. The Examiner was advised that applicant would be filing the present Amendment containing amendments to the claims and the Examiner agreed to consider the Amendment.

Rejections in the Office Action

The rejection of claims 1 and 3-17 under 35 U.S.C. 103(a) as being unpatentable over Lynch (US 4,471,001) is respectfully traversed for the reasons set forth below.

The Examiner has characterized the Lynch reference as teaching a maltitol syrup

containing 25-94% maltitol, 2-30% sorbitol and 0.05-2% reducing sugars and higher saccharides on a dry weight basis. This is incorrect. With respect to the "0.05-2%" portion of the syrup, Lynch teaches that this is the amount of reducing sugars, not the amount of the higher saccharides. This is clear from: (1) the wording in Lynch "and reducing sugar 0.05-2% and higher saccharides", wherein the "0.05-2%" modifies reducing sugar and not higher saccharides, and (2) the syrups formed in the Examples of Lynch, which contain anywhere from 2.6 (Preparation III) to 47% (Preparation I) higher saccharides on a dry weight basis. It is respectfully submitted that the lowest amount of higher saccharides disclosed anywhere in the Lynch reference is in the estimated amount of higher saccharides for Preparation II, which is said to be 2.1 to 2.6% by weight of the dry solids. The highest amount of higher saccharides disclosed in Lynch is 41-47% (Preparation I, column 2, lines 63-68). Accordingly, it is respectfully submitted that the broadest possible teachings provided by Lynch are maltitol syrups that contain:

a) 25 to 94% by weight maltitol;
b) 2 to 30% by weight sorbitol;
c) 2.1 to 47% by weight higher saccharides; and
d) 0.05 to 2% by weight reducing sugars.
(all weight percents on a dry solids basis)

With respect to the amounts of maltitol that were previously recited in claims 3-17, the Examiner stated that these amounts were "94.2 to 97% by weight maltitol". These amounts are also incorrect. The amounts previously recited in claims 3-17 were from 94.2 to 99% by weight maltitol (dry solids basis). The Examiner took the position that it would be within the skill in the art to "optimize" the amount of malititol in the syrups of Lynch through routine experimentation. The motivation to do so was supposed to be provided by the teachings in Lynch that "maltitol syrups are surprisingly resistant to the proliferation of airborne microorganisms such as mold when the total solids content is about 75% by weight and preferably about 80%" (quote from page 4, lines 2-5, of the Office Action which was quoting column 1, lines 47-51 of Lynch). The Examiner stated that if these teachings in Lynch were followed, one of ordinary skill in the art would obtain the claimed maltitol solutions and that, therefore, the claimed maltitol solutions

were obvious over Lynch.

It is respectfully submitted that the Examiner's analysis is fundamentally flawed. First, Lynch does not teach a maltitol syrup that contains more than 94% by weight. Accordingly, one cannot "optimize" the syrups of Lynch to obtain a maltitol syrup containing more than 94% by weight maltitol. Optimization of the maltitol syrups of Lynch would lead one to a syrup that contained somewhere between 25 and 94% by weight maltitol (based on dry solids), since that is the broadest range taught in Lynch. In addition, there is no teaching in Lynch of how the properties of the syrup are changed by changes in the amount of maltitol. Accordingly, the amount of maltitol cannot be said to be recognized in Lynch as a result effective variable. Second, the Examiner has pointed to the only teaching in Lynch concerning optimization of a result effective variable (i.e., the solids content of the syrup) as somehow supporting the Examiner's position. In fact, this teaching in Lynch completely defeats the Examiner's obviousness argument since this teaching would lead one to create a maltitol syrup that contains at least 75% by weight solids. In contrast, the maltitol solutions of at least present claims 1, 3-9 and 13 all have less than 75% by weight solids. Further, since claims 2, 18 and 19 each claim a method of making the maltitol solution of claim 1, these claims also contain the limitation that the solids content of the final maltitol solution is less than 75% by weight. Accordingly, none of these claims can possibly be obvious over the teachings of the Lynch patent, which clearly teaches away from using maltitol syrups that contain less than 75% by weight solids because those syrups will support the growth of airborne microorganisms such as mold (see col. 1, lines 47-51, and col. 3, lines 42-47, of Lynch).

With respect to claims 10-12 and 14-17, which do not contain a limitation on the amount of solids in the maltitol syrup, these claims are each distinguishable from Lynch based on the amount of maltitol in the solution. As discussed above, Lynch does not provide any teaching that the maltitol content is a result effective variable. Lynch also does not contain any teaching of a maltitol syrup with greater than 94% maltitol (based on dry solids). As the amount of maltitol changes, the amount of at least one of the other components in the syrup must also change. Lynch does not provide a teaching concerning which other component will change if the maltitol content is increased or decreased and does not explain how that will effect the properties of the syrup. Accordingly, the maltitol content of the syrups taught in Lynch cannot be "optimized" so that they are outside of the range disclosed in Lynch (i.e., you can only

"optimize" something that is recognized to be a result effective variable – see MPEP 2144.05 (II)(B)).

In addition to the above, it is respectfully submitted that claim 7 can also be distinguished from Lynch for another reason. Specifically, claim 7 is now directed to a narrow embodiment of the present invention wherein the amount of hydrogenated trisaccharides, hydrogenated tetrasaccharides and hydrogenated polysaccharides higher than tetrasaccharides is at a minimum (see, for example, the compositions of the examples, such as Batches G and H in Table 1). In this embodiment of the present invention, the maximum total amount of these hydrogenated higher saccharides is 2% (i.e., 1% plus 1% = 2%), which is outside of the broadest range taught by Lynch and far below the amounts of higher saccharides that are in the specific compositions that were actually made in the Lynch reference.

Actual Teaching of Lynch Concerning Maltitol Content of the Syrups

In addition to the above remarks, it is respectfully submitted that although the Lynch reference discloses broad ranges for each of the components of the maltitol syrups, including a range for maltitol that is from 25-94% by weight on a dry basis, there are only three maltitol syrups that appear to have been actually made and characterized in the Lynch reference. Those three syrups are the Preparation II syrup that is described in the production of Preparation III, Preparation III itself and Preparation IV of the Lynch reference. The syrups described in the paragraphs entitled Preparation I and Preparation II, have compositions that are given in broad ranges for each ingredient, which cannot be considered to be a specific disclosure of a particular syrup composition. The syrups described in the paragraphs entitled Preparation I and Preparation II were either not made or were not actually characterized, so that their compositions were just estimated. With respect to the three maltitol syrups that Lynch describes in detail, the specific Preparation II syrup that was used to produce Preparation III is the only one of the three maltitol syrups that has a high maltitol content (over 85% by weight on a solids basis). This Preparation II is said to contain 94% by weight maltitol, 5% sorbitol and 2.6% higher saccharides. However, a person of skill in this art would immediately recognize that this composition is impossible because the cumulative percentages of the components exceeds 100% (e.g., the cumulative percentages equal 101.6%). If the percentage of each component is reduced

proportionally so that the total will equal 100%, then the composition would actually have been 92.5% maltitol, 4.9% sorbitol and 2.6% higher saccharides. However, this composition could not have been used to produce Preparation III in the manner described in the paragraph describing the production of Preparation III (i.e., a 50/50 blend of a material from Preparation I containing 19.8% water with a material from Preparation II containing 22.5% water and the composition shown above), because a simple mass balance on each ingredient shows that if the composition of the Preparation II material was 92.5% maltitol, 4.9% sorbitol and 2.6% higher saccharides and the water content was 22.5%, then the composition of the material from Preparation I (having 19.8% water) would be 44.1% maltitol, 9.98% sorbitol, 39.2% higher saccharides and 0.0823% reducing sugars. This composition would not even fall within the broad ranges described for Preparation I because it is deficient in both sorbitol and higher saccharides. Since the amount of reducing sugars is within the range described for Preparation I and there is no reducing sugar content in the Preparation II used to make Preparation III, we can assume that the reducing sugar content is correct. Using that as a starting point and assuming that the amount of sorbitol and higher saccharides are at least the minimum amounts specified for Preparation I (i.e., 11% sorbitol and 41% higher saccharides), we can calculate that the amount of maltitol that was actually in the Preparation II that was used to make Preparation III was 47.9%, which is close to the maximum amount (i.e., 49%) of maltitol that is permitted in Preparation I. This means that if the composition of Preparation III is accurate, the amount of maltitol that was in the Preparation II used to make Preparation III was 88.5% by weight (dry basis). **Accordingly, it is respectfully submitted that a person of skill in this art, upon reading the disclosure in the Lynch patent contained at column 3, lines 15 to 23 (the Preparation III paragraph), would immediately understand that the composition described as Preparation II was in error and that the amount of maltitol was, at a maximum, 92.5% by weight. It is also respectfully submitted that, upon realizing that this error had been made by Lynch, the artisan would have set out to determine the actual amount of maltitol in the Preparation II and would have determined, through simple mass balances, that the actual amount was, at a maximum, 88.5% by weight (solids basis).**

Since the Preparation II that was used to make Preparation III is the only specific teaching of a formulation in the Lynch reference that contained a high amount of maltitol and

this teaching is clearly flawed in that the composition provided is obviously incorrect on its face, **it is respectfully submitted that the only relevant teaching in Lynch is of a maltitol syrup that has 92.5% by weight (dry basis) maltitol (at a maximum and the actual teaching is less than that, probably about 88.5% by weight maltitol).** The amounts of sorbitol and higher saccharides in that maltitol syrup would obviously be more than what is specifically disclosed in Lynch to make up for the lower amount of maltitol (e.g., the amount of higher saccharides would be greater than 2.6%). In any event, it is respectfully submitted that the only example of a 94% by weight maltitol syrup that was disclosed in Lynch is clearly in error and this brings into question the 94% by weight maltitol upper limit that Lynch discloses for the range of maltitol in the formulation. It is clear that Lynch was relying on the 94% maltitol example to support the upper limit of the range for maltitol. **Since the amount of maltitol in that formulation was, at best 92.5%, and more likely 88.5%, by weight maltitol, it is respectfully submitted that the disclosure of Lynch is not enabling for maltitol syrups that contain 94% by weight maltitol. An artisan of ordinary skill in this art would not have an expectation of success of producing a maltitol syrup having a maltitol content of 94% by weight (solids basis) after reviewing the teachings of the Lynch patent.**

Summary of Arguments With Respect to the Lynch Reference

In view of the above discussion, it is respectfully submitted that the Lynch patent does not and cannot support a prima facie case of obviousness with respect to the maltitol solutions of the present claims. Specifically, the Lynch patent teaches away from maltitol syrups that contain less than 75% by weight solids and, when the entire teachings of the Lynch patent are taken into consideration (including the errors discussed above), the Lynch patent cannot be said to provide an enabling teaching or an expectation of success for producing maltitol syrups that contain more than 88.5 to 92.5% by weight maltitol (dry solids basis). In addition, with respect to claim 7, the Lynch patent contains no teaching or suggestion that the amount of higher saccharides can be 2% or less.

In addition, the Examiner's reasoning for why one of ordinary skill in this art would be motivated to modify the teachings of the Lynch reference in order to obtain the maltitol solution

of the present claims is incorrect and actually supports the non-obviousness of the present claims. Specifically, the Examiner acknowledged in the last paragraph of page 5 of the Office Action that the motivation for modifying Lynch is found in the Lynch reference in the teachings concerning the "proliferation of airborne microorganisms such as mold when the total solids content is about 75% by weight and preferably about 80%". However, this teaching would motivate an artisan of ordinary skill to keep the solids content high, above 75%, and teaches away from dropping the solids content below 75% (because the syrups are then susceptible to mold growth). Thus, the teachings of the Lynch reference would not motivate a person of ordinary skill in this art to modify the maltitol syrups of Lynch so that the solids content is less than 75% by weight.

Moreover, the Lynch reference contains no teaching whatsoever of a maltitol syrup having a maltitol content above 94% by weight (solids basis). As applicants have discussed in detail above, the true teachings of the Lynch reference do not even support or enable a maltitol syrup that has 94% by weight (solids basis) maltitol. Instead, due to clear errors made in the Lynch reference, the maximum amount of maltitol in the maltitol syrups of the Lynch reference is really 88.5 to 92.5% by weight (solids basis). In any event, the Lynch reference cannot be said to disclose or suggest maltitol syrups that contain more than 94% by weight maltitol (solids basis). For this reason, claims 1 and 3-17 are clearly novel and non-obvious over the Lynch reference.

The rejection of claims 2 and 18-19 under 35 U.S.C. 103(a) as being unpatentable over Lynch (US 4,471,001) in view of Darsow (US 5,641,872) is respectfully traversed for the reasons set forth below.

As discussed above, the Examiner's characterization of the teachings of Lynch is incorrect. There is no overlap between the maltitol solutions of the present claims and the maltitol syrups of Lynch et al. and the maltitol solutions of the present claims are not obvious in view of the teachings in Lynch. Accordingly, the Examiner's initial premise (i.e., that the compositions of claims 1 and 10 are obvious) is incorrect.

With respect to the process aspects of the method claims, applicant agrees with the

Examiner's statement that Lynch does not teach a process for making maltitol syrups wherein the hydrogenation step employs a reaction promoter comprising magnesium powder. To overcome this deficiency in the teachings of the Lynch reference, the Examiner has cited the Darsow reference, which allegedly shows the use of "non-catalytic pyrophoric metal powders" such as aluminum, manganese or titanium in combination with a hydrogenation nickel catalyst to produce epimer free maltitol. According to the Examiner, "one skilled in this art would be motivated to substitute the aluminum powder (pyrophoric metal powder) of said prior art with the non-catalytic pyrophoric metal powder of magnesium because the use of magnesium may also be helpful in the higher hydrogenation activity due to its reducing properties which renders the instantly claimed use of pyrophoric magnesium powder obvious."

It is respectfully submitted that the Examiner's reasoning for why the use of magnesium powder would be obvious in view of the Darsow reference is both incorrect and clearly based on a hindsight analysis. The Darsow reference does not contain any of the teachings that the Examiner relies on in the obviousness rejection. For example, the Darsow reference does not teach that magnesium is an acceptable metal for addition to the hydrogenation reaction. It also does not teach that magnesium has reducing properties or that magnesium is pyrophoric. In fact, the present application does not disclose or claim that the magnesium powder is pyrophoric. Accordingly, the Examiner's comments concerning the "instantly claimed use of pyrophoric magnesium powder" is not understood. Magnesium is not pyrophoric unless it is very pure and has a very high surface area (such as extremely fine powder). The present application does not teach that the magnesium powder is pyrophoric and, given that the magnesium powder is being used in an aqueous environment, even if the magnesium powder was pyrophoric, this property would be completely irrelevant in the process of the present claims.

It is respectfully submitted that the only teaching contained in the Darsow reference concerning magnesium is a general teaching that one of the major deficiencies of the prior art hydrogenation processes was that they used alkaline earth metals (presumably to adjust the pH of the hydrogenation solution) and those metals then had to be laboriously removed from the end product (see column 3, lines 17-22). Thus, since magnesium is an alkaline earth metal, and the Darsow reference teaches that the use of alkaline earth metals was a problem with the prior art,

the Darsow reference teaches away from the use of magnesium.

Still further, the Examiner has apparently overlooked the fact that the entire focus of the Darsow reference is that the specific process described therein, which uses a special catalyst which is shaped and has a specific composition, reduces the expense of the catalyst and permits the hydrogenation reaction to be run at a much lower temperature (i.e., from 40 to 80 °C) (see column 3, lines 50-65, and column 4, lines 7-11). Darsow stresses the use of the lower temperature during hydrogenation and teaches that the use of higher temperatures (above 80 °C) is disadvantageous and problematic (see paragraph bridging columns 5 and 6 – wherein it is taught that the hydrogenation temperature should be from 40 to 80°C, preferably 55 to 70°C, and that "Higher temperatures lead to uncontrolled side reactions (caramelization, ether cleavage or hydrogenating cracking), which can lead to discolorations and the formation of further undesirable by-products"). Thus, it is incontrovertible that Darsow teaches away from using the elevated hydrogenation temperatures that are used in the Lynch reference (i.e., 160°C, see col. 2, lines 53-58, of Lynch) and claimed in the present application (i.e., 100 to 190°C).

Finally, since neither Lynch nor Darsow contains any specific teaching concerning the use of a magnesium powder promoter in the hydrogenation process, it is respectfully submitted that the Examiner is using the teachings of the present application to support the obviousness rejection, which is a classic example of the improper use of hindsight to reconstruct the claimed invention. **The cited prior art provides absolutely no specific teachings at all concerning magnesium, and the only general teaching is that the use of alkaline earth metals is to be avoided. Thus, without using the teachings of the present application, a person of ordinary skill in this art would not even consider the use of magnesium powder in the hydrogenation process.**

In view of all of the above, it is respectfully submitted that the rejection of claims 2 and 18-19 under 35 U.S.C. 103 (a) is improper and should be withdrawn.

It is respectfully submitted that all of the present claims are in allowable condition. Accordingly, issuance of a Notice of Allowability for claims 1-20 of the present application is respectfully requested.

Should the Examiner have any questions concerning this paper, the Examiner is invited to telephone applicant's undersigned representative.

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Respectfully submitted,

By _____

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